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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/517,866

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EXAMINER

GUGLIOTTA, NICOLE T

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/517,866	<b>Applicant(s)</b> SUWABE ET AL.	
	<b>Examiner</b> NICOLE T. GUGLIOTTA	<b>Art Unit</b> 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 - 22 and 27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 22 and 27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 21 is objected to because of the following informalities: This claim appears to be missing a subject noun between "said" and "is". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

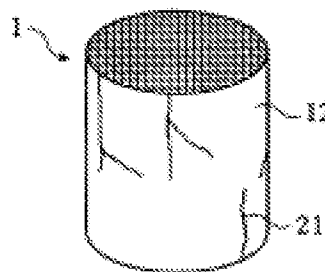
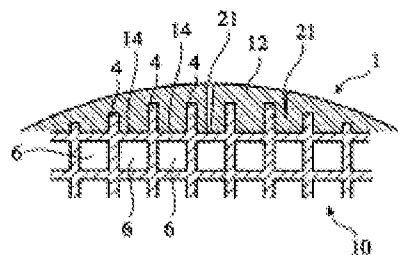
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1 – 6, 8 - 15, 17 - 18, 20 – 22, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Kotani et al. (U.S. Patent No. 5,629,067).

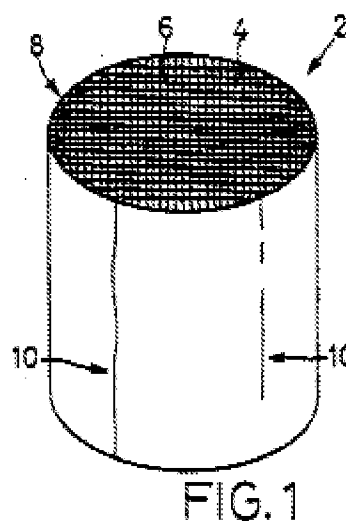
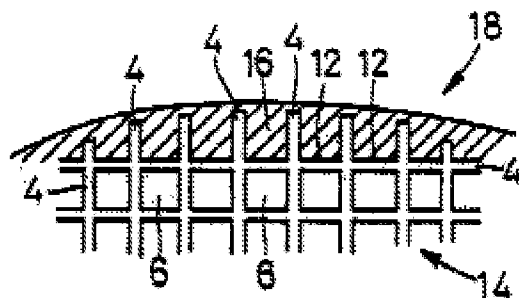
4. **APPLICANT'S INVENTION**

**Fig. 5**



5.

6. PRIOR ART (Kotani et al.)



7.

8. In regard to claim 1, Kotani disclose a ceramic honeycomb body (14) having the axial grooves (12) on its outer periphery, the outer coating (16) (corresponds to applicant's peripheral wall layer) having a suitable thickness is formed such that at least the grooves (12) are filled with a reinforcing coating material which gives the coating (16) (Column 6, Lines 30 – 31).

9. In regard to claims 1, 2, 4 - 6, 9, 10, 12 - 14 the partition walls (4) in an outer peripheral portion of the honeycomb body (2) are deformed, giving rise to a distorted cell portion (8) in which the cells (6) are distorted or deformed, while some cracks (10) are formed in the outer wall of the honeycomb body (2) (corresponds to applicant's

stress release portions (voids) at least partially in said peripheral wall layer) (Column 5, Lines 6 - 10). Examiner takes the position a crack and a slit are analogous terms.

10. In regard to claim 3 and 11, Figure 1 of Kotani et al. disclose a crack/void (10) (left side of honeycomb structure), which is the full length of said ceramic honeycomb structure.

11. In regard to claim 8, Kotani et al. disclose thermal stresses are minimized when the honeycomb body and outer coating have the same degree of thermal expansion. Otherwise the lower thermal expansion of the outer coating is preferred for effectively preventing cracks and other defects in the outer coating (outer wall) due to the thermal stresses. To reduce the thermal expansion of the outer coating, it is effective to reduce the thermal expansion of the aggregate, to be lower than that of a matrix provided by the inorganic binder having a relatively high coefficient of thermal expansion is favorably used as the aggregate, to thereby reduce the thermal expansion of the outer coating, and make the resultant honeycomb structure highly resistant to thermal stresses (Column 7, Lines 23 – 36).

12. In regard to claim 17, Kotani et al. disclose the outer coating (16) thus formed on the outer surface of the honeycomb body (14) is then dried or fired as needed, depending on the kind of the coating material used, whereby the outer coating (16) is secured to the ceramic honeycomb body (15). In this connection, the honeycomb body (14) may be fired upon the firing of the outer coating (16) (Column 8, Lines 31 – 36).

13. In regard to claim 18, Kotani et al. disclose (Table 3) the isostatic strength of an outer periphery of a honeycomb body (with grooves) to range from 27.6 – 40.0 kg/cm<sup>2</sup>.

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Using the formula:  $X \text{ kg/cm}^2 \times 14.233/145 = Y \text{ MPa}$ , the above stated range is equivalent to 2.7 – 3.9 MPa. If the outer periphery of a honeycomb body has an isostatic strength greater than 1.5 MPa, then the honeycomb structure would also have an isostatic strength greater than 1.5 MPa.

14. In regard to claims 20, 21 Kotani et al. disclose the outer coating contains a matrix, which is generally an amorphous oxide matrix, which is preferably formed by using colloidal silica or colloidal alumina as the inorganic binder (Column 7, Lines 54 – 58). The cordierite particles may be wholly or partially replaced by organic ceramic fibers formed of amorphous mullite or amorphous silica alumina. The use of such ceramic fibers is advantageous in avoiding cracks in the outer coating and effectively preventing peeling-off of the coating (Column 7, Lines 44 – 49).

15. In regard to claims 22 and 27, Kotani et al. disclose the matrix is generally an amorphous oxide matrix, which is preferably formed by using colloidal silica or colloidal alumina as the inorganic binder (Column 7, Lines 55 – 58) and 3 - 35 parts by weight of the solid portion of the colloidal oxides (such as colloidal silica or colloidal alumina) per 100 parts by weight of the cordierite particles and/or ceramic fibers (Column 7, Line 66 - Column 8, Line 3). The cordierite particles may be wholly or partially replaced by ceramic fibers formed of an amorphous mullite or amorphous silica alumina, for example (Column 7, Lines 44 - 46).

***Claim Rejections - 35 USC § 103***

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16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kotani et al.

18. Kotani et al. do not disclose a quantitative value for the number of cracks/slits in a honeycomb body.

19. It would have been obvious to one skilled in the art at the time the invention was made that the optimum percentage of grooves having voids/slits/cracks (relative to the total amount of grooves) is a result effective variable, which can be experimentally determined. The scope of the invention by Kotani et al. is not limited by the number of cracks.

20. Claim 16, 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kotani et al., in view of Horikawa et al. (U.S. 5,188,779).

21. In regard to claims 16 and 17, Kotani et al. does not disclose removing the peripheral wall before firing.

22. Horikawa et al. disclose the peripheral portion of the ceramic honeycomb fired body is removed by working, preferably by grinding, to make the size of the fired body

smaller than an intended size. Finally, the outer peripheral surface of the ceramic honeycomb fired body having the outer peripheral portion removed is coated with a coating material, which is dried to cure the coating material and produce the ceramic honeycomb structural body having the intended size (Column 3, Lines 41 - 49).

23. It would have been obvious to one skilled in the art at the time the invention was made that the coating (corresponds to applicant's peripheral wall layer) may be applied to the honeycomb using different methods - either (1) removing the peripheral wall, firing, and then adding the coating, or (2) applying the coating before firing, as evidenced by Kotani et al. and Horikawa et al. Both methods produce the same product.

24. In regard to claim 19, Kotani et al. does not disclose the addition of a pore forming agent to the honeycomb slurry, or quantitative values for porosity and pore size.

25. Horikawa et al. disclose a pore forming agent added to the slurry, for example graphite, starch powder and sawdust (Column 3, Lines 13 - 16).

26. At the time the applicant's invention was made it would have been obvious to add a pore forming agent to make a porous ceramic honeycomb structure, as it was common in the art at the time the invention was, as evidenced by Horikawa et al. The porosity and average pore size of the honeycomb structure is dependent upon the type and amount of pore forming agent used, and is therefore a result effective variable that can be determined experimentally.



***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICOLE T. GUGLIOTTA whose telephone number is (571)270-1552. The examiner can normally be reached on M - Th 8:30 - 6 p.m., & every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NICOLE T. GUGLIOTTA  
Examiner  
AU 1794

/Carol Chaney/

Supervisory Patent Examiner, Art Unit 1794